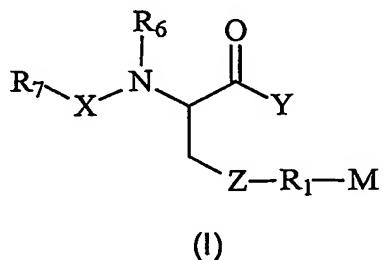


The claims defining the invention are as follows:

1. A compound having the formula (I), or a pharmaceutically acceptable derivative, salt, racemate, isomer or tautomer thereof:



wherein

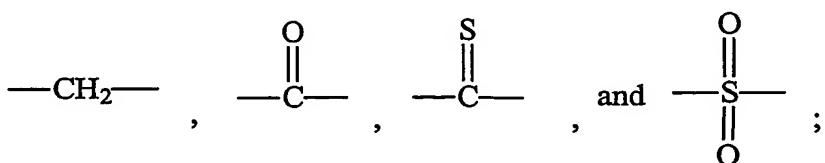
10 Z is S or CH<sub>2</sub>;

R<sub>1</sub> is a linking moiety;

M is a zinc binding moiety containing at least one heteroatom;

15 R<sub>6</sub> is selected from the group consisting of H, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl and a nitrogen protecting group;

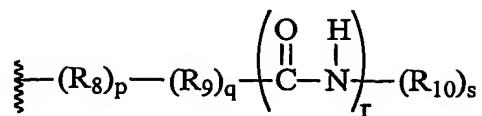
20 X is selected from the group consisting of:



Y is selected from the group consisting: of -NR<sub>4</sub>R<sub>5</sub>, -OR<sub>4</sub>, -SR<sub>4</sub>, -CH<sub>2</sub>R<sub>4</sub>,

25 CHR<sub>4</sub>R<sub>5</sub>, C(R<sub>4</sub>)<sub>2</sub>R<sub>5</sub>, PHR<sub>4</sub> and PR<sub>4</sub>R<sub>5</sub>,

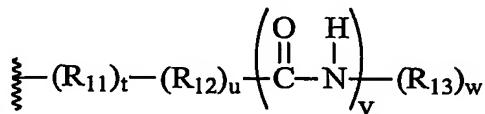
wherein R<sub>4</sub> is a group of formula:



wherein R<sub>8</sub>, R<sub>9</sub> and R<sub>10</sub> are each independently selected from the group  
 5 consisting of optionally substituted alkyl, optionally substituted alkenyl,  
 optionally substituted alkynyl, optionally substituted cycloalkyl, optionally  
 substituted aryl, optionally substituted heteroaryl, and optionally  
 substituted heterocycloalkyl;

10 p, q, r and s are each independently 0 or 1, provided that at least one of  
 p, q or s is 1;

R<sub>5</sub> is H or a group of formula:

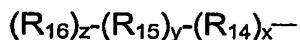


15 wherein R<sub>11</sub>, R<sub>12</sub> and R<sub>13</sub> are each independently selected from the  
 group consisting of optionally substituted alkyl, optionally substituted  
 alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl,  
 20 optionally substituted aryl, optionally substituted heteroaryl, or optionally  
 substituted heterocycloalkyl;

t, u, v and w are each independently 0 or 1, provided that at least one of  
 t, u and w is 1;

25

R<sub>7</sub> is a group of formula:



30 wherein R<sub>14</sub>, R<sub>15</sub> and R<sub>16</sub> are independently selected from the group  
 consisting of optionally substituted alkyl, optionally substituted alkenyl,

optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl and optionally substituted heterocycloalkyl,

5       x, y and z are independently 0 and 1 with the proviso that at least one of  
x, y and z is 1.

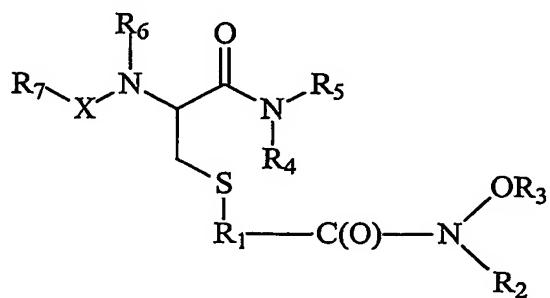
2.       A compound as in claim 1, wherein the zinc binding moiety is a group of  
formula  $-C(O)-NR_2-OR_3$  where  $R_2$  is H, optionally substituted alkyl, optionally  
10      substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, or  
a nitrogen protecting group and  $R_3$  is H, optionally substituted alkyl, optionally  
substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl or  
an oxygen protecting group.

15     3.       A compound as in claim 2, wherein the linking moiety has between 1 and  
9 atoms in the normal chain.

4.       A compound as in claim 3, wherein the linking moiety has between 1 and  
4 atoms in the normal chain.

20     5.       A compound as in claim 4, wherein the linking moiety is an n-propyl  
chain.

25     6.       A compound having the formula (IIIa), or a pharmaceutically acceptable  
derivative, salt, racemate, isomer or tautomer thereof:



(IIIa)

wherein

5       $R_1$  is optionally substituted  $C_1\text{-}C_4$  alkyl, optionally substituted  $C_1\text{-}C_4$  alkenyl or optionally substituted  $C_1\text{-}C_4$  alkynyl;

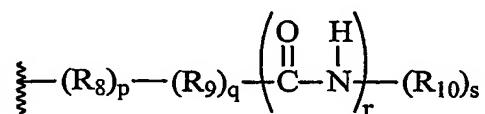
$R_2$  is H, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, or a nitrogen protecting group;

10

$R_3$  is H, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl or an oxygen protecting group;

15

$R_4$  is a group of formula:

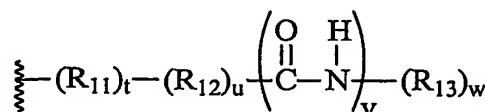


20      wherein  $R_8$ ,  $R_9$  and  $R_{10}$  are each independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, and optionally substituted heterocycloalkyl;

25

$p$ ,  $q$ ,  $r$  and  $s$  are each independently 0 or 1, provided that at least one of  $p$ ,  $q$  or  $s$  is 1;

$R_5$  is H or a group of formula:



30

wherein R<sub>11</sub>, R<sub>12</sub> and R<sub>113</sub> are each independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, or optionally substituted heterocycloalkyl;

5

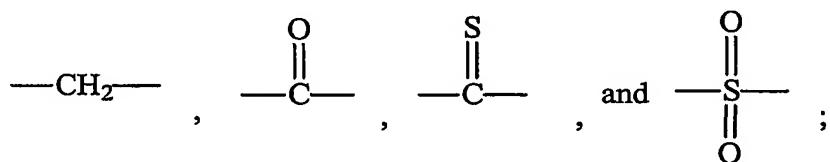
t, u, v and w are each independently 0 or 1, provided that at least one of t, u and w is 1.

10

R<sub>6</sub> is selected from the group consisting of H, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl and a nitrogen protecting group;

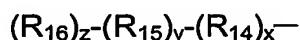
X is selected from the group consisting of

15



R<sub>7</sub> is a group of formula:

20



25

wherein R<sub>14</sub>, R<sub>15</sub> and R<sub>16</sub> are independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl and optionally substituted heterocycloalkyl;

x, y and z are independently 0 and 1 with the proviso that at least one of x, y and z is 1.

30

7. A compound as in claim 6, wherein R<sub>1</sub> is optionally substituted C<sub>1</sub>-C<sub>4</sub> alkyl.

5 8. A compound as in claim 7, wherein R<sub>1</sub> is n-propyl.

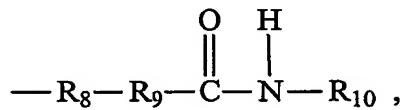
9. A compound as in claim 6, wherein R<sub>2</sub> is either H, optionally substituted C<sub>1</sub>-C<sub>4</sub> alkyl or a nitrogen protecting group.

10 10. A compound as in claim 9, wherein R<sub>2</sub> is H.

11. A compound as in claim 6, wherein R<sub>3</sub> is either H, optionally substituted C<sub>1</sub>-C<sub>4</sub> alkyl or an oxygen protecting group.

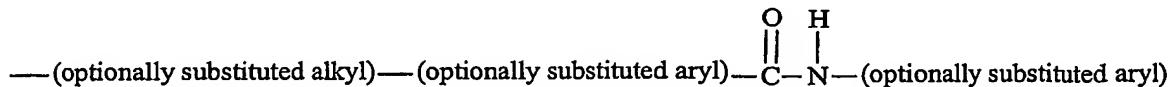
15 12. A compound as in claim 11, wherein R<sub>3</sub> is H.

13. A compound as in claim 6, wherein R<sub>4</sub> is of the formula:



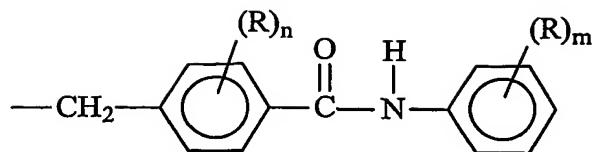
20 wherein R<sub>8</sub>, R<sub>9</sub> and R<sub>10</sub> are each independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, and optionally substituted heterocycloalkyl.

25 14. A compound as in claim 13, wherein R<sub>4</sub> is of the formula:



30 15. A compound as in claim 14, wherein R<sub>4</sub> is a group of the formula.

118



wherein each R is independently selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroaryl, cycloalkyl, heterocycloalkyl, halo, haloalkyl,

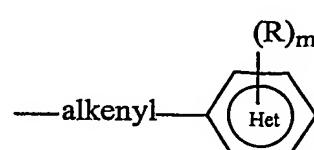
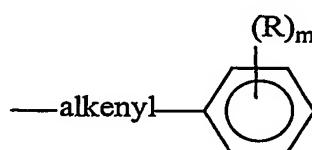
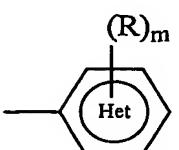
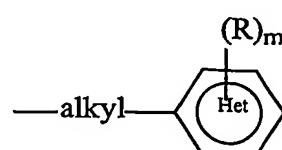
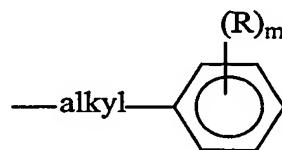
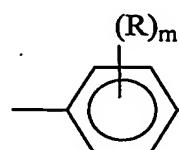
- 5      haloalkenyl, haloalkynyl, haloaryl, haloheteroaryl, halocycloalkyl, haloheterocycloalkyl, hydroxy, alkoxy, alkenyloxy, aryloxy, heteroaryloxy, cycloalkyloxy, heterocycloalkyloxy, benzyloxy, haloalkoxy, haloalkenyloxy, haloaryloxy, halohetoraryloxy, nitro, nitroalkyl, nitroalkenyl, nitroalkynyl, nitroaryl, nitroheteroaryl, nitroheterocyclyoalkyl, amino, alkylamino, 10     dialkylamino, alkenylamino, alkynylamino, arylamino, heteroaryl amino, diarylamino, benzylamino, dibenzylamino, acyl, alkenylacyl, alkynylacyl, arylacyl, heteroarylacyl, acylamino, diacylamino, acyloxy, alkylsulphonyloxy, arylsulphonyloxy, heterocycloalkylamino, alkylsulphonyl, arylsulphonyl, carboalkoxy, carboaryloxy, alkylthio, benzylthio, acylthio, cyano, nitro, sulfate 15     and phosphate;

n is 0-4, and

m is 0-5.

20

16. A compound as in claim 13, wherein R<sub>4</sub> has one of the following formulae:



wherein each R is independently selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroaryl, cycloalkyl, heterocycloalkyl, halo, haloalkyl, haloalkenyl, haloalkynyl, haloaryl, haloheteroaryl, halocycloalkyl, haloheterocycloalkyl, hydroxy, alkoxy, alkenyloxy, aryloxy, heteroaryloxy, cycloalkyloxy, heterocycloalkyloxy, benzyloxy, haloalkoxy, haloalkenyloxy, haloaryloxy, halohetoraryl, nitro, nitroalkyl, nitroalkenyl, nitroalkynyl, nitroaryl, nitroheteroaryl, nitroheterocyclyoalkyl, amino, alkylamino, dialkylamino, alkenylamino, alkynylamino, arylamino, heteroaryl amino, diarylamino, benzylamino, dibenzylamino, acyl, alkenylacyl, alkynylacyl, arylacyl, heteroarylacyl, acylamino, diacylamino, acyloxy, alkysulphonloxy, arylsulphonyloxy, heterocycloalkylamino, alkylsulphonyl, arylsulphnyl, carboalkoxy, carboaryloxy, alkylthio, benzylthio, acylthio, cyano, nitro, sulfate and phosphate;

15 and each m is from 0-5.

17. A compound as in claim 6, wherein R<sub>5</sub> is either H or optionally substituted alkyl.

20 18. A compound as in claim 17, wherein R<sub>5</sub> is H.

19. A compound as in claim 6, wherein X is a carbonyl group.

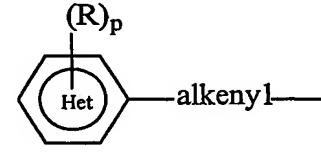
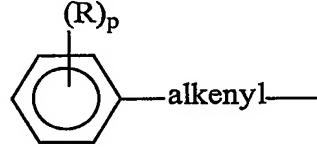
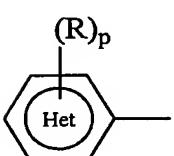
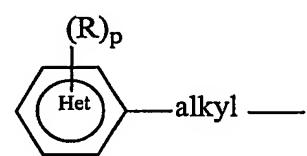
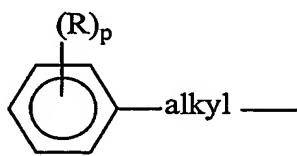
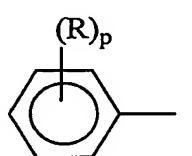
25 20. A compound as in claim 19, wherein R<sub>6</sub> is either H or a nitrogen protecting group.

21. A compound as in claim 20, wherein R<sub>6</sub> is H.

22. A compound as in claim 19, wherein R<sub>7</sub> is selected from the group 30 consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted cycloalkyl, optionally substituted heteroaryl, optionally substituted heterocycloalkyl, optionally substituted aryl alkyl, optionally substituted heteroaryl alkyl, optionally substituted cycloalkyl alkyl, optionally substituted

heterocycloalkyl alkyl, optionally substituted aryl alkenyl, optionally substituted hetero alkenyl, optionally substituted cycloalkyl alkenyl, optionally substituted heterocycloalkyl alkenyl, optionally substituted aryl alkynyl, optionally substituted heteroaryl alkynyl, optionally substituted cycloalkyl alkynyl, and  
5     optionally substituted heterocycloalkyl alkynyl.

23. A compound as in claim 22, wherein R<sub>7</sub> has one of the following formula:



10

wherein each R is independently selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroaryl, cycloalkyl, heterocycloalkyl, halo, haloalkyl, haloalkenyl, haloalkynyl, haloaryl, haloheteroaryl, halocycloalkyl,  
15     haloheterocycloalkyl, hydroxy, alkoxy, alkenyloxy, aryloxy, heteroaryloxy, cycloalkyloxy, heterocycloalkyloxy, benzyloxy, haloalkoxy, haloalkenyloxy, haloaryloxy, haloheteroaryloxy, nitro, nitroalkyl, nitroalkenyl, nitroalkynyl, nitroaryl, nitroheteroaryl, nitroheterocycloalkyl, amino, alkylamino, dialkylamino, alkenylamino, alkynylamino, arylamino, heteroarylamino,  
20     diarylamino, benzylamino, dibenzylamino, acyl, alkenylacyl, alkynylacyl, arylacyl, heteroarylacyl, acylamino, diacylamino, acyloxy, alkylsulphonloxy, arylsulphonyloxy, heterocycloalkylamino, alkylsulphonyl, arylsulphonyl, carboalkoxy, carboaryloxy, alkylthio, benzylthio, acylthio, cyano, nitro, sulfate and phosphate;

25

and each p is from 0-5.

24. A compound as in claim 6, wherein the compound has a potency of cytotoxicity of  $IC_{50}$  10  $\mu\text{M}$  against MM96 melanoma cells.

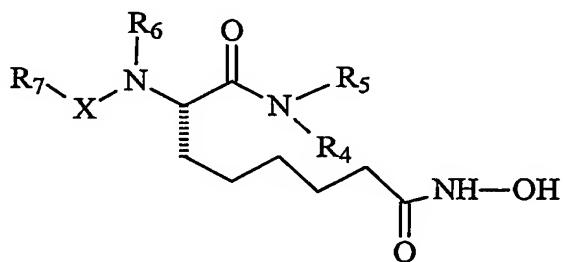
25. A compound as in claim 24, wherein the compound has a Selectivity Index of 1.5.

26. A compound as in claim 25, wherein the compound has a potency of  $IC_{50}$  1  $\mu\text{M}$  against the MM96 melanoma cells and a Selectivity Index of 3.

27. A compound as in claim 26, wherein the compound has a potency of  $IC_{50}$  0.5  $\mu\text{M}$  against the MM96 melanoma cells and a Selectivity Index of 4.

28. A compound having the formula (IIIb), or a pharmaceutically acceptable derivative, salt, racemate, isomer or tautomer thereof:

15



(IIIb)

20 wherein

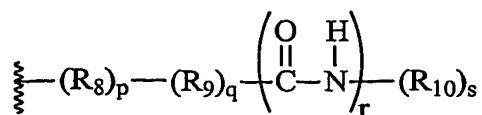
$R_1$  is optionally substituted  $C_1$ - $C_4$  alkyl, optionally substituted  $C_1$ - $C_4$  alkenyl or optionally substituted  $C_1$ - $C_4$  alkynyl;

25  $R_2$  is H, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, or a nitrogen protecting group;

122

$R_3$  is H, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl or an oxygen protecting group;

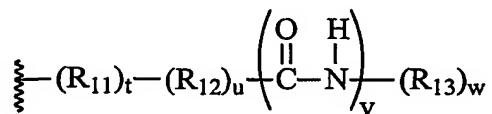
5  $R_4$  is a group of formula:



wherein  $R_8$ ,  $R_9$  and  $R_{10}$  are each independently selected from the group  
10 consisting of optionally substituted alkyl, optionally substituted alkenyl,  
optionally substituted alkynyl, optionally substituted cycloalkyl, optionally  
substituted aryl, optionally substituted heteroaryl, and optionally  
substituted heterocycloalkyl;

15  $p$ ,  $q$ ,  $r$  and  $s$  are each independently 0 or 1, provided that at least one of  
 $p$ ,  $q$  or  $s$  is 1;

$R_5$  is H or a group of formula:



20

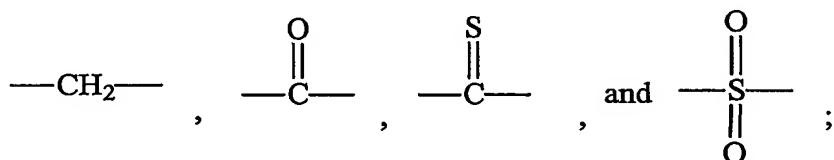
wherein  $R_{11}$ ,  $R_{12}$  and  $R_{13}$  are each independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl,  
25 optionally substituted aryl, optionally substituted heteroaryl, or optionally substituted heterocycloalkyl;

$t$ ,  $u$ ,  $v$  and  $w$  are each independently 0 or 1, provided that at least one of  
 $t$ ,  $u$  and  $w$  is 1.

30

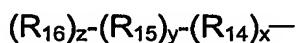
$R_6$  is selected from the group consisting of H, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl and a nitrogen protecting group;

5        X is selected from the group consisting of



$R_7$  is a group of formula:

10



15

wherein  $R_{14}$ ,  $R_{15}$  and  $R_{16}$  are independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl and optionally substituted heterocycloalkyl;

20

x, y and z are independently 0 and 1 with the proviso that at least one of x, y and z is 1.

25

29. A compound as in claim 28, wherein  $R_1$  is optionally substituted C<sub>1</sub>-C<sub>4</sub> alkyl.

30. A compound as in claim 29, wherein  $R_1$  is n-propyl.

31. A compound as in claim 28, wherein  $R_2$  is either H, optionally substituted C<sub>1</sub>-C<sub>4</sub> alkyl or a nitrogen protecting group.

30

32. A compound as in claim 31, wherein R<sub>2</sub> is H.

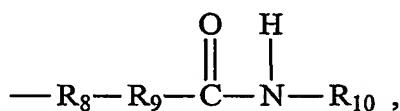
33. A compound as in claim 28, wherein R<sub>3</sub> is either H, optionally substituted C<sub>1</sub>-C<sub>4</sub> alkyl or an oxygen protecting group.

5

34. A compound as in claim 33, wherein R<sub>3</sub> is H.

35. A compound as in claim 28, wherein R<sub>4</sub> is of the formula:

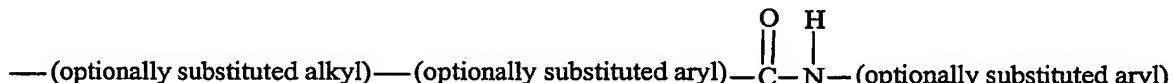
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wherein R<sub>8</sub>, R<sub>9</sub> and R<sub>10</sub> are each independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, and optionally substituted heterocycloalkyl.

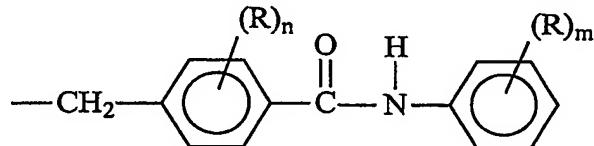
36. A compound as in claim 35, wherein R<sub>4</sub> is of the formula:

20



37. A compound as in claim 36, wherein R<sub>4</sub> is a group of the formula.

25



wherein each R is independently selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroaryl, cycloalkyl, heterocycloalkyl, halo, haloalkyl, haloalkenyl, haloalkynyl, haloaryl, haloheteroaryl, halocycloalkyl, haloheterocycloalkyl, hydroxy, alkoxy, alkenyloxy, aryloxy, heteroaryloxy,

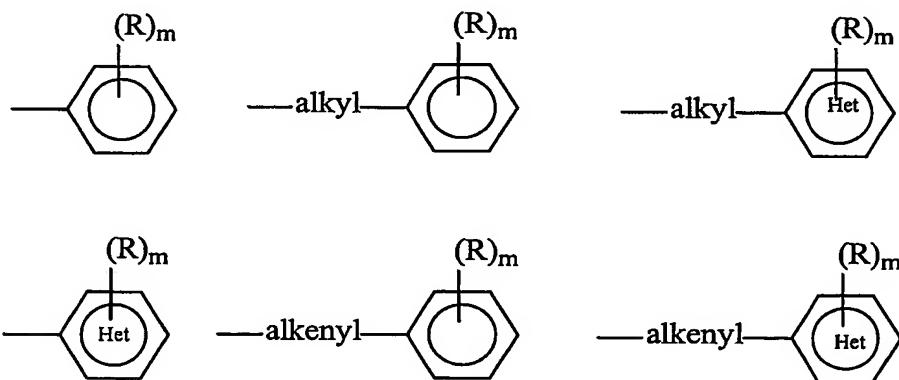
cycloalkyloxy, heterocycloalkyloxy, benzyloxy, haloalkoxy, haloalkenyloxy, haloaryloxy, haloheterarylloxy, nitro, nitroalkyl, nitroalkenyl, nitroalkynyl, nitroaryl, nitroheteroaryl, nitroheterocyclyoalkyl, amino, alkylamino, dialkylamino, alkenylamino, alkynylamino, arylamino, heteroarylarnino, diarylamino, benzylamino, dibenzylamino, acyl, alkenylacyl, alkynylacyl, arylacyl, heteroarylacyl, acylamino, diacylamino, acyloxy, alkylsulphonyloxy, arylsulphonyloxy, heterocycloalkylamino, alkylsulphonyl, arylsulphonyl, carboalkoxy, carboaryloxy, alkylthio, benzylthio, acylthio, cyano, nitro, sulfate and phosphate;

10

n is 0-4, and

m is 0-5.

15 38. A compound as in claim 35, wherein R<sub>4</sub> has one of the following formulae:



20 wherein each R is independently selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroaryl, cycloalkyl, heterocycloalkyl, halo, haloalkyl, haloalkenyl, haloalkynyl, haloaryl, haloheteroaryl, halocycloalkyl, haloheterocycloalkyl, hydroxy, alkoxy, alkenyloxy, aryloxy, heteroaryloxy, cycloalkyloxy, heterocycloalkyloxy, benzyloxy, haloalkoxy, haloalkenyloxy, haloaryloxy, haloheterarylloxy, nitro, nitroalkyl, nitroalkenyl, nitroalkynyl, nitroaryl, nitroheteroaryl, nitroheterocyclyoalkyl, amino, alkylamino, dialkylamino, alkenylamino, alkynylamino, arylamino, heteroarylarnino,

25

diaryl amino, benzyl amino, dibenzyl amino, acyl, alkenyl acyl, alkynyl acyl, aryl acyl, heteroaryl acyl, acyl amino, diacyl amino, acyloxy, alkylsulphonioxy, arylsulphonyloxy, heterocycloalkyl amino, alkylsulphonyl, arylsulphonyl, carboalkoxy, carboaryloxy, alkylthio, benzylthio, acylthio, cyano, nitro, sulfate  
5 and phosphate;

and each m is from 0-5.

39. A compound as in claim 28, wherein R<sub>5</sub> is either H or optionally  
10 substituted alkyl.

40. A compound as in claim 39, wherein R<sub>5</sub> is H.

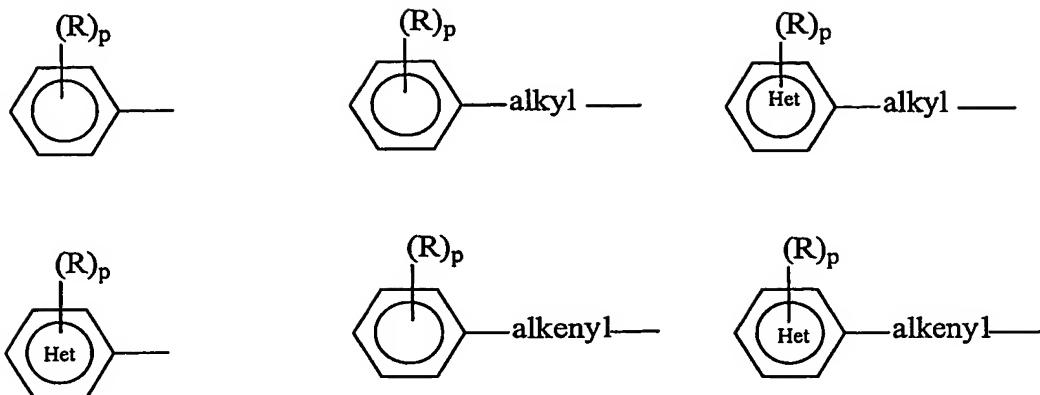
41. A compound as in claim 28, wherein X is a carbonyl group.  
15

42. A compound as in claim 41, wherein R<sub>6</sub> is either H or a nitrogen protecting group.

43. A compound as in claim 42, wherein R<sub>6</sub> is H.  
20

44. A compound as in claim 41, wherein R<sub>7</sub> is selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted cycloalkyl, optionally substituted heteroaryl, optionally substituted heterocycloalkyl, optionally substituted aryl alkyl, optionally substituted heteroaryl alkyl, optionally substituted cycloalkyl alkyl, optionally substituted heterocycloalkyl alkyl, optionally substituted aryl alkenyl, optionally substituted hetero alkenyl, optionally substituted cycloalkyl alkenyl, optionally substituted heterocycloalkyl alkenyl, optionally substituted aryl alkynyl, optionally substituted heteroaryl alkynyl, optionally substituted cycloalkyl alkynyl, and optionally substituted heterocycloalkyl alkynyl.  
25  
30

45. A compound as in claim 44, wherein R<sub>7</sub> has one of the following formula:



wherein each R is independently selected from the group consisting of alkyl,

- 5 alkanyl, alkynyl, aryl, heteroaryl, cycloalkyl, heterocycloalkyl, halo, haloalkyl, haloalkenyl, haloalkynyl, haloaryl, haloheteroaryl, halocycloalkyl, haloheterocycloalkyl, hydroxy, alkoxy, alkenyloxy, aryloxy, heteroaryloxy, cycloalkyloxy, heterocycloalkyloxy, benzyloxy, haloalkoxy, haloalkenyloxy, haloaryloxy, haloheteroaryloxy, nitro, nitroalkyl, nitroalkenyl, nitroalkynyl, 10 nitroaryl, nitroheteroaryl, nitroheterocycloalkyl, amino, alkylamino, dialkylamino, alkenylamino, alkynylamino, arylamino, heteroarylarnino, diarylamino, benzylamino, dibenzylamino, acyl, alkenylacyl, alkynylacyl, arylacyl, heteroarylacyl, acylamino, diacylamino, acyloxy, alkylsulphonyloxy, 15 arylsulphonyloxy, heterocycloalkylamino, alkylsulphonyl, arylsulphonyl, carboalkoxy, carboaryloxy, alkylthio, benzylthio, acylthio, cyano, nitro, sulfate and phosphate;

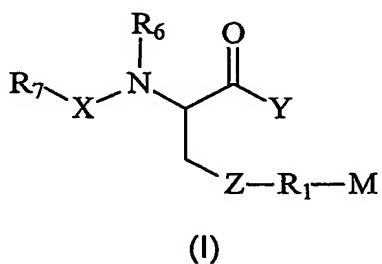
and each p is from 0-5.

- 20 46. A compound as in claim 28, wherein the compound has a potency of cytotoxicity of  $IC_{50}$  10  $\mu\text{M}$  against MM96 melanoma cells.

47. A compound as in claim 46, wherein the compound has a Selectivity Index of 1.5.

- 25 48. A compound as in claim 47, wherein the compound has a potency of  $IC_{50}$  1  $\mu\text{M}$  against the MM96 melanoma cells and a Selectivity Index of 3.

49. A compound as in claim 48, wherein the compound has a potency of IC<sub>50</sub> 0.5 μM against the MM96 melanoma cells and a Selectivity Index of 4.
- 5 50. A method for the treatment of cancer in an animal, the method including the step of administering to the animal in need of such treatment an effective amount of a compound having the formula (I), or a pharmaceutically acceptable derivative, salt, racemate, isomer or tautomer thereof:



wherein

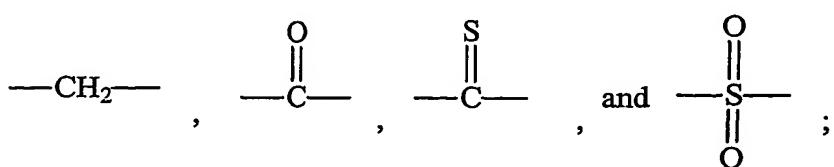
15 Z is S or -CH<sub>2</sub>-;

R<sub>1</sub> is a linking moiety;

M is a zinc binding moiety containing at least one heteroatom;

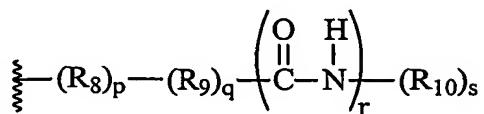
20 R<sub>6</sub> is selected from the group consisting of H, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl and a nitrogen protecting group;

25 X is selected from the group consisting of:



Y is selected from the group consisting: of -NR<sub>4</sub>R<sub>5</sub>, -OR<sub>4</sub>, -SR<sub>4</sub>, -CH<sub>2</sub>R<sub>4</sub>, CHR<sub>4</sub>R<sub>5</sub>, C(R<sub>4</sub>)<sub>2</sub>R<sub>5</sub>, PHR<sub>4</sub> and PR<sub>4</sub>R<sub>5</sub>,

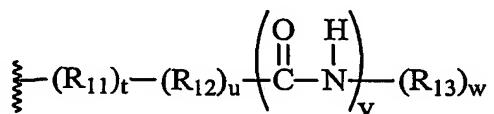
5 wherein R<sub>4</sub> is a group of formula:



10 wherein R<sub>8</sub>, R<sub>9</sub> and R<sub>10</sub> are each independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, and optionally substituted heterocycloalkyl;

15 p, q, r and s are each independently 0 or 1, provided that at least one of p, q or s is 1;

R<sub>5</sub> is H or a group of formula:



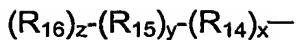
20

25 wherein R<sub>11</sub>, R<sub>12</sub> and R<sub>13</sub> are each independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, or optionally substituted heterocycloalkyl;

t, u, v and w are each independently 0 or 1, provided that at least one of t, u and w is 1;

30

R<sub>7</sub> is a group of formula:



wherein R<sub>14</sub>, R<sub>15</sub> and R<sub>16</sub> are independently selected from the group  
 5 consisting of optionally substituted alkyl, optionally substituted alkenyl,  
 optionally substituted alkynyl, optionally substituted cycloalkyl, optionally  
 substituted aryl, optionally substituted heteroaryl and optionally  
 substituted heterocycloalkyl,

10 x, y and z are independently 0 and 1 with the proviso that at least one of  
 x, y and z is 1.

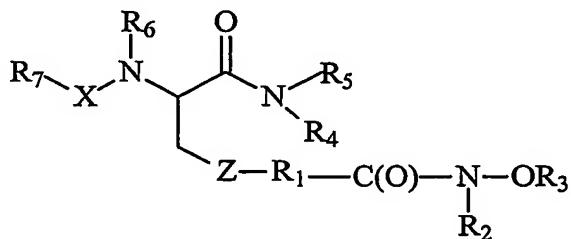
51. A method as in claim 50, wherein the linking moiety has between 1 and 9  
 atoms in the normal chain.

15 52. A method as in claim 51, wherein the linking moiety has between 1 and 4  
 atoms in the normal chain.

53. A method as in claim 52, wherein the linking moiety is an n-propyl chain.

20 54. A method for the treatment of cancer in an animal, the method including  
 the step of administering to the animal in need of such treatment an effective  
 amount of a compound having the formula (III), or a pharmaceutically  
 acceptable derivative, salt, racemate, isomer or tautomer thereof:

25



(III)

wherein

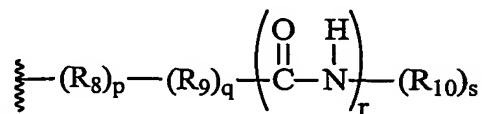
30 Z is S or CH<sub>2</sub>;

R<sub>1</sub> is optionally substituted C<sub>1</sub>-C<sub>4</sub> alkyl, optionally substituted C<sub>1</sub>-C<sub>4</sub> alkenyl or optionally substituted C<sub>1</sub>-C<sub>4</sub> alkynyl;

5 R<sub>2</sub> is H, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, or a nitrogen protecting group;

10 R<sub>3</sub> is H, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl or an oxygen protecting group;

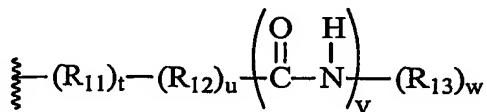
R<sub>4</sub> is a group of formula:



15 wherein R<sub>8</sub>, R<sub>9</sub> and R<sub>10</sub> are each independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, and optionally substituted heterocycloalkyl;

20 p, q, r and s are each independently 0 or 1, provided that at least one of p, q or s is 1;

25 R<sub>5</sub> is H or a group of formula:



30 wherein R<sub>11</sub>, R<sub>12</sub> and R<sub>13</sub> are each independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl,

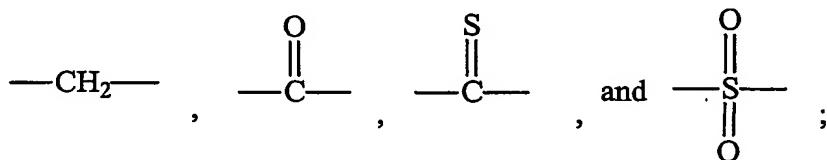
optionally substituted aryl, optionally substituted heteroaryl, or optionally substituted heterocycloalkyl;

t, u, v and w are each independently 0 or 1, provided that at least one of  
5 t, u and w is 1;

R<sub>6</sub> is selected from the group consisting of H, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl and a nitrogen protecting group;

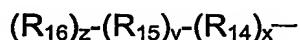
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X is selected from the group consisting of



15

R<sub>7</sub> is a group of formula:



20

wherein R<sub>14</sub>, R<sub>15</sub> and R<sub>16</sub> are independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl and optionally substituted heterocycloalkyl,

25

x, y and z are independently 0 and 1 with the proviso that at least one of x, y and z is 1.

55. A method for the treatment of cancer as in claim 54, wherein R<sub>1</sub> is optionally substituted C<sub>1</sub>-C<sub>4</sub> alkyl.

30

56. A method for the treatment of cancer as in claim 55, wherein R<sub>1</sub> is propyl.

57. A method for the treatment of cancer as in claim 54, wherein R<sub>2</sub> is either H, optionally substituted C<sub>1</sub>-C<sub>4</sub> alkyl or a nitrogen protecting group.

5

58. A method for the treatment of cancer as in claim 57, wherein R<sub>2</sub> is a nitrogen protecting group.

59. A method for the treatment of cancer as in claim 57, wherein R<sub>2</sub> is H.

10

60. A method for the treatment of cancer as in claim 54, wherein R<sub>3</sub> is either H, optionally substituted C<sub>1</sub>-C<sub>4</sub> alkyl or an oxygen protecting group.

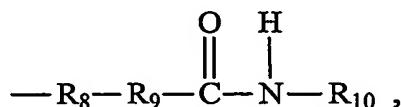
15

61. A method for the treatment of cancer as in claim 60, wherein R<sub>3</sub> is an oxygen protecting group.

62. A method for the treatment of cancer as in claim 60, wherein R<sub>3</sub> is H.

20

63. A method for the treatment of cancer as in claim 54, wherein R<sub>4</sub> is of the formula:

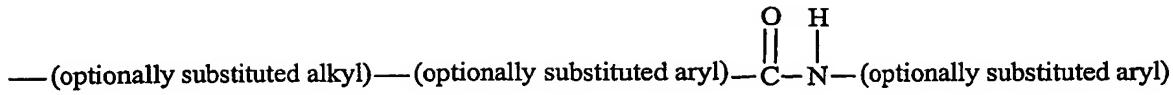


25

wherein R<sub>8</sub>, R<sub>9</sub> and R<sub>10</sub> are each independently selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heteroaryl, and optionally substituted heterocycloalkyl.

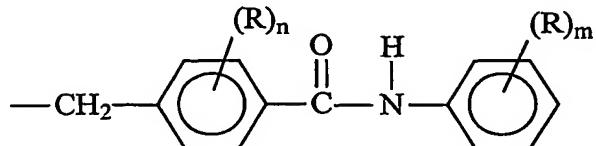
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64. A method for the treatment of cancer as in claim 63, wherein R<sub>4</sub> is of the formula:



65. A method for the treatment of cancer as in claim 64, wherein R<sub>4</sub> is a group of the formula.

5



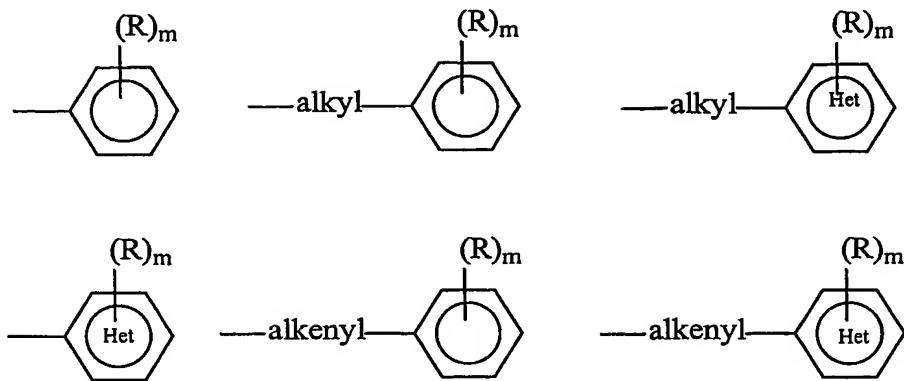
wherein each R is independently selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroaryl, cycloalkyl, heterocycloalkyl, halo, haloalkyl, 10 haloalkenyl, haloalkynyl, haloaryl, haloheteroaryl, halocycloalkyl, haloheterocycloalkyl, hydroxy, alkoxy, alkenyloxy, aryloxy, heteroaryloxy, cycloalkyloxy, heterocycloalkyloxy, benzyloxy, haloalkoxy, haloalkenyloxy, haloaryloxy, halohetaryloxy, nitro, nitroalkyl, nitroalkenyl, nitroalkynyl, nitroaryl, nitroheteroaryl, nitroheterocyclyoalkyl, amino, alkylamino, 15 dialkylamino, alkenylamino, alkynylamino, arylamino, heteroarylarnino, diarylamino, benzylamino, dibenzylamino, acyl, alkenylacyl, alkynylacyl, arylacyl, heteroarylacyl, acylamino, diacylamino, acyloxy, alkylsulphonyloxy, arylsulphonyloxy, heterocycloalkylamino, alkylsulphonyl, arylsulphonyl, carboalkoxy, carboaryloxy, alkylthio, benzylthio, acylthio, cyano, nitro, sulfate 20 and phosphate;

n is 0-4, and

m is 0-5.

25

66. A method for the treatment of cancer as in claim 64, wherein R<sub>4</sub> has one of the following formulas:



wherein each R is independently selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroaryl, cycloalkyl, heterocycloalkyl, halo, haloalkyl,

- 5 haloalkenyl, haloalkynyl, haloaryl, haloheteroaryl, halocycloalkyl, haloheterocycloalkyl, hydroxy, alkoxy, alkenyloxy, aryloxy, heteroaryloxy, cycloalkyloxy, heterocycloalkyloxy, benzyloxy, haloalkoxy, haloalkenyloxy, haloaryloxy, halohetorarylloxy, nitro, nitroalkyl, nitroalkenyl, nitroalkynyl, nitroaryl, nitroheteroaryl, nitroheterocyclyoalkyl, amino, alkylamino, 10 dialkylamino, alkenylamino, alkynylamino, arylamino, heteroarylarnino, diarylamino, benzylamino, dibenzylamino, acyl, alkenylacyl, alkynylacyl, arylacyl, heteroarylacyl, acylamino, diacylamino, acyloxy, alklysulphonloxy, arylsulphonyloxy, heterocycloalkylamino, alkylsulphonyl, arylsulphnyl, carboalkoxy, carboaryloxy, alkylthio, benzylthio, acylthio, cyano, nitro, sulfate 15 and phosphate;

and each m is from 0-5.

- 67. A method for the treatment of cancer as in claim 54, wherein R<sub>5</sub> is either 20 H or optionally substituted alkyl.

68. A method for the treatment of cancer as in claim 67, wherein R<sub>5</sub> is H.

- 69. A method for the treatment of cancer as in claim 54, wherein X is a 25 carbonyl group.

70. A method for the treatment of cancer as in claim 69, wherein R<sub>6</sub> is either H or a nitrogen protecting group.

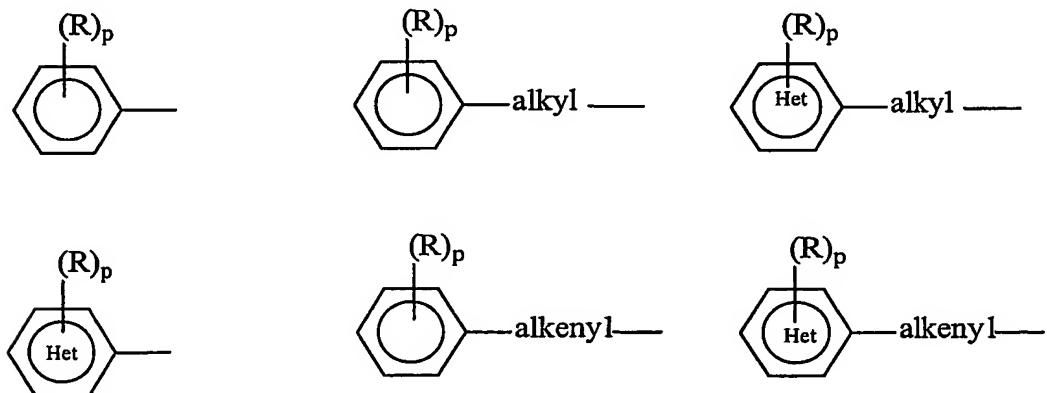
71. A method for the treatment of cancer as in claim 70, wherein R<sub>6</sub> is H.

5

72. A method for the treatment of cancer as in claim 69, wherein R<sub>7</sub> is selected from the group consisting of optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, optionally substituted cycloalkyl, optionally substituted heteroaryl, optionally substituted heterocycloalkyl, optionally substituted aryl alkyl, optionally substituted heteroaryl alkyl, optionally substituted cycloalkyl alkyl, optionally substituted heterocycloalkyl alkyl, optionally substituted aryl alkenyl, optionally substituted hetero alkenyl, optionally substituted cycloalkyl alkenyl, optionally substituted heterocycloalkyl alkenyl, optionally substituted aryl alkynyl, optionally substituted heteroaryl alkynyl, optionally substituted cycloalkyl alkynyl, and optionally substituted heterocycloalkyl alkynyl.

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15  
20  
25

73. A method for the treatment of cancer as in claim 72, wherein R<sub>7</sub> has one of the following formula:



wherein each R is independently selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroaryl, cycloalkyl, heterocycloalkyl, halo, haloalkyl, haloalkenyl, haloalkynyl, haloaryl, haloheteroaryl, halocycloalkyl, haloheterocycloalkyl, hydroxy, alkoxy, alkenyloxy, aryloxy, heteroaryloxy,

cycloalkyloxy, heterocycloalkyloxy, benzyloxy, haloalkoxy, haloalkenyloxy, haloaryloxy, halohetaryloxy, nitro, nitroalkyl, nitroalkenyl, nitroalkynyl, nitroaryl, nitroheteroaryl, nitroheterocyclyoalkyl, amino, alkylamino, dialkylamino, alkenylamino, alkynylamino, arylamino, heteroarylarnino, diarylamino, benzylamino, dibenzylamino, acyl, alkenylacyl, alkynylacyl, arylacyl, heteroarylacyl, acylamino, diacylamino, acyloxy, alklysulphonloxy, arylsulphonyloxy, heterocycloalkylamino, alkylsulphonyl, arylsulphonyl, carboalkoxy, carboaryloxy, alkylthio, benzylthio, acylthio, cyano, nitro, sulfate and phosphate;

10

and each p is from 0-5.

74. A method for the treatment of cancer as in claim 54, wherein the compound has a potency of cytotoxicity of  $IC_{50}$  10  $\mu M$  against MM96 melanoma cells.

15

75. A method for the treatment of cancer as in claim 74, wherein the compound has a Selectivity Index of 1.5.

20

76. A method for the treatment of cancer as in claim 75, wherein the compound has a potency of  $IC_{50}$  1  $\mu M$  against the MM96 melanoma cells and a Selectivity Index of 3.

25

77. A method for the treatment of cancer as in claim 76, wherein the compound has a potency of  $IC_{50}$  0.5  $\mu M$  against the MM96 melanoma cells and a Selectivity Index of 4.

30

78. A method for the treatment of cancer as in claim 54, wherein the animal is a human.

79. A pharmaceutical composition containing one or more of the compounds of any one of claims 1 to 49 and a pharmaceutically acceptable, carrier, diluent or excipient.

80. The use of a compound of any one of claims 1 to 49 for the preparation of a medicament for the treatment of cancer.

81. A compound according to claim 1 and substantially as hereinbefore  
5 described with reference to the accompanying examples.

DATED: 26 November 2004

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10 Attorneys for:

The University of Queensland